Blood Donation and Altruism: The Mechanism of Altruism (MOA) Approach

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Abstract

Is blood donation a pure altruistic act? The answer to this question has profound implications for the type of interventions we can adopt and the way in which research is conducted into blood donor behaviour. This review will address this question and the implications of the answer by introducing the mechanisms of altruism (MOA) approach. As a behaviour, it is argued that blood donation, is altruistic, but the motivation for the act may not be. The MOA approach draws on insights from biology, economics and psychology to identify the key MOA that can be used to describe the motivations of blood donors. The MOA requires identifying congruency between self-report measures of motivations and behavioural indices of MOA derived from economic games. Using the MOA approach, we will show that blood donation is not pure altruism (caring about the welfare of others at personal expense) but rather a mixture of warm-glow giving (finding the act of donation emotionally rewarding) and reluctant altruism (cooperation in the face of free-riding rather than punishment of free-riders). With motivations that are not purely altruistic, six novel avenues for interventions are described: (1) charitable and financial incentives, (2) guilt priming, (3) norms focused on donor rates, (4) voluntary reciprocal altruism (VRA) (5) warm-glow appeals and (6) empathizing with a single case. We show how the MOA approach provides a framework for other theoretical models and present a model of donor motivation across the donation cycle.

Key Questions Concerning Altruistic Blood Donation

From the perspectives of policy makers, clinicians, researchers, donors, recipients, and the general non-donating public, pure altruism (i.e., helping another, at a personal cost without personal gain) is assumed to be the bedrock of blood donation [1]. This assumption has crucial implications for (1) intervention strategies and (2) conducting research into donor motivations. If pure altruism is the underlying principle for blood donation then a key issue become whether or not we should preclude interventions that highlight personal benefits or provide financial incentives? I will discuss these issues and others below and introduce the mechanisms of altruism (MOA) approach to address these questions [2].

What is Altruism and is Blood Donation Altruistic?

Altruism has been variously defined across the social and biological sciences as well as in philosophy [1]. From an evolutionary biology perspective, altruism has a very specific definition: to increase Darwinian fitness (i.e., long-term survival and fecundity) of the recipient at a cost to the donor (usually long term fitness) [3-4]. While there is some debate over the precise definition of altruism [3-4], in blood donor research we are concerned with *psychological* altruism (motives for action) rather than *biological* altruism (Darwinian fitness) [5]. As such, definitions of altruism from the social sciences (psychology and economics particularly) are more applicable. Definitions of altruism across economics, psychology and philosophy tend to converge on the idea that altruism is either a preference or ultimate desire to maximize the welfare (utility) of others, by reducing their suffering, at a personal cost, without personal benefit [6-8]. Consistent with this the Nuffield Council on Bioethics define altruism as an action "…that is motivated by concern for the welfare of the recipient of some beneficent behaviour, rather than by concern for the welfare of the person carrying out the action (p 139 [1])". The Nuffield Council [1] also highlights, that while a behaviour may

appear altruistic, it may be selfishly motivated, such as helping others to enhance personal reputation [9]. They state: “We do not think it important from an ethical perspective that altruism is thoroughly 'pure'. First, someone may donate biological materials because it also makes them feel good to help others. In a sense the donor’s own pleasure may lie at the root of their decision. But cases such as these remain altruistic for our purposes, on the grounds that concern for the welfare of others is a genuine motivator, and on the grounds that a disposition to help others can be reckoned as virtuous whether or not founded on the pleasure such action brings to the donor (p 139 [1])”. Indeed, from an economic and psychological perspective, the scenario described above would be considered ‘impure altruism’ [6-7]. However, the general public and vast majority of donors normatively describe pure altruism as the bedrock of blood donation [10-11]. This may well reflect the fact that at a behavioural level, blood donation may be regarded as an archetypal pure altruistic act. That is, the blood donor acts voluntarily, for the benefit another at a personal cost.

The Mechanisms of Altruism (MOA) Approach

The fact that at blood donation may not reflect pure altruism led Ferguson [2, 12-13] to develop a ‘mechanisms of altruism’ (MOA) approach to donor motivation. This approach involves applying the theoretical insights derived from biological, economic and psychological sciences, concerning the MOA, to blood donor research. The aim of doing so is to define more clearly blood donors’ underlying motivations with the aim of developing more targeted interventions. The MOA approach also involves cross-validating self-reported motivations with preferences derived from economic games. Table 1 details some of the key MOA and their application to understanding blood donor motivations.

Of the MOA derived from the biology literature, three have some potential role in explaining blood donor behaviour: downstream indirect reciprocity, strong reciprocity and costly signalling

theory (CST). Traditionally, down-stream reciprocity operates via reputation building and one way to do this is to display publically your donation status. The behavioural evidence that there is suggest that donors rarely express publically that they are a blood donor (Ferguson & Chandler, 1995). Also, intentions based on social recognition via social media are lower than intentions not based on social approval (Chell & Mortimer, 2014). However, Chell and Mortimer, (2014) show that social recognition, via social media, increases donor intentions but specifically for donors with motivations to donate that focus of social approval/acceptability, displaying that they have made a difference and are a good person, then (Chell & Mortimer, 2014). Thus intervention based on social approval may only be effective for certain groups of donors. Downstream indirect reciprocity may also operate when after receiving a successful transfusion, a friend or relative of that recipient goes on to be a blood donor out of gratitude to the transfusion service.

Strong reciprocators have a preference to help those who act fairly and punish those who act unfairly. A key feature of strong reciprocation is that this help is not contingent on expecting any future reciprocation personally. This lack of expected reciprocation is important when considering strong reciprocation as a potential motivation for blood donation, as the donor and recipient are anonymous and will never meet. As such, any reciprocation is not possible. Blood donation may also act as a costly signal [10]. Costly signals are non-fakable displays that indicate that the organism can sustain the cost of the display, thus, indicating fitness to potential mates [14]. Costly signalling theory (CST) suggests what is important is *who* makes the displays about their altruism and *when* [14]. A prediction from CST is that childless donors, in their fertile years, will be more likely to tell people they are a blood donor [14].

In terms of economic models, warm-glow, inequality aversion and conditional cooperation all have implications for blood donor motivation. Warm-glow suggests that people are motivated to help

because it makes them feel good about themselves [3]. The Nuffield Council directly highlight warm-glow in relation to blood and organ donation, suggesting people donate "…because it also makes them feel good to help others" (p 139). Feeling good after donating has also been shown to increase the likelihood of future donations [15]. Models of inequality aversion suggest that people are motivated to *reduce inequality* between themselves and others [16]. When you have more than others, inequality is termed advantageous. Advantageous inequality leads to guilt and it is argued that people are motivated to reduce these feelings of guilt by reducing the inequality [16]. The potential donor is healthy and is able to give blood, thus the donor is relatively better off than the unhealthy recipients. Thus, it is reasonable to ask if blood donors are likely to be motivated by guilt. Finally, conditional cooperation suggests that people help others in a conditional manner [17]. If others offer little help the conditional cooperator also offers little help, if others offer a lot of help the conditional cooperator also offers a lot of help. However, in all cases the conditional cooperator offers help at a slightly lower level than others. In samples studied so far, about 50% of people are conditional cooperators [17]. If conditional cooperation is a mechanism underling blood donation, then knowing that very few people already donate will *not* motivate conditional cooperators to donate. This may sustain the constant low level of donation in the population, which runs at about 4%.

Psychological models of altruism have focused primarily on motivations, emotional regulation via the negative state relief (NSR) model, reluctant altruism and personality [18]. Evidence shows that empathic personality traits are not linked to blood donation [12-13, 19], but traits like conscientiousness (e.g., hardworking, organized) are [20]. However, both NSR and reluctant altruism do offer some promising insights into blood donor motivations. The NSR model suggests that people help to reduce the negative emotions they feel arising from seeing or imagining another in distress [21]. Thus considering a recipient in need may motive someone to donate to in order to reduce the negative feeling this causes. Reluctant altruism was first identified and described by

Ferguson et al [22]. Reluctant altruism is a preference to help, in the face of free-riding, rather than punish the free-riders [2, 22-23]. The reluctant altruist is motivated to help because they believe the cause is worthy but do not trust others to help. The negative emotions they feel towards free-riding and the lack of trust in others further energize them into helping [24]. Reluctant altruism is important for two reasons. First, reluctant altruism is emerging as a new and important motivator for blood donation [2, 22-23]. Second, reluctant altruism challenges an established model of altruism – that the punishment of free-riders leads to cooperation. As such, reluctant altruism offers a novel contribution to the literature of altruism [2].

Implications of MOA for Methodology

The MOA approach draws heavily on the distinction between: (1) behavioural altruism (β-altruism: behavioural indicators of altruism derived from preferences in economic games), (2) psychological altruism (ψ-altruism: motivations for altruism) and (3) biological altruism (B-altruism: Darwinian fitness) [25]. This leads to two clear methodological implications.

The first is the need to use behavioural measures of altruism (β-altruism) to cross-validate self-reported altruistic motivations (ψ-altruism). Ferguson [2] details the types of behavioural games that can be used to assess pure altruism, warm-glow, conditional cooperation and so on. This cross-validation helps circumvent problems of the self-presentational bias inherent in self-reports.

The second implication is to explore the neurobiology of altruism in blood donors. This will help to validate some of the key motivational distinctions suggested for reluctant altruism and warm-glow. For example, increased activity in pathways linked to oxytocin (as well as levels of oxytocin) and increased vagus nerve activity have been linked to increased trust and pro-sociality [26-27]. The reluctant altruist is hypothesized to lack trust in others willing to cooperate. As such, blood donor scoring high on reluctant altruism should have lower endogenous oxytocin levels. Increased

dopamine and activity in dopaminergic pathways have been linked to greater giving and feelings of warm-glow [28]. Ferguson [2] suggests that blood donors may be *warm-glow junkies* who are attracted to donate blood to get their warm-glow fix. This suggests that either blood donors could have a less sensitive dopaminergic pathway and seek out high warm-glow affording contexts. Alternatively a model more akin to addiction may operate, whereby the dopaminergic system becomes sensitized and they need to return to donate to get their warm-glow "fix" [15]. Either way, the study of the links between blood donors' motivation and their underlying neurological responses would be a worthy pursuit. For example, the question "do blood donors who experience greater warm-glow, show a greater post-donation rise in oxytocin than those who do not experience strong warm-glow?", can be tested directly.

Evidence from the MOA Approach

Work using the MOA approach is in its infancy, but findings suggest that blood donors are saintly sinning, warm-glow giving, reluctant altruists [2]. Ferguson et al. [15] compared blood donors and non-blood donors on variants of an economic game – a charity dictator game (CDG) – to assess altruism and warm-glow. In the CDG participants decide how much of a monetary endowment to give to a charity of their choice. In the warm-glow version, the financial consequence of the participant's donation is removed via one-for-one crowding out. That is, however much the participants give to the charity, the experiment takes the same amount away from the charity's endowment (see [2, 15] for exact details of the games). Thus as the charity cannot financially benefit from the donation, the only motive to give is warm-glow. The pattern of results was very informative. While both donors and non-donors were generous in the CDG, donors gave significantly less than non-donors. This can be interpreted as 'saintly sinning' [29]. Being a blood donor allows the donor to define themselves as a good person, therefore they feel they have some

'moral justification' for behaving less pro-socially in another domain; in this case donating to a charity. However, a complete reversal is observed in a warm-glow CDG. Again both donors and non-donors were generous, however, this time donors were more generous than non-donors. This behavioural data resonates with self-report data showing that both personal benefit and warm-glow predict behavioural *intentions* to donate in experienced blood donors [22] and *actual attendance* to donate [13]. Ferguson et al [22] also showed that reluctant altruism was an important predictor of donation intentions in first time and novice donors, but not experienced donors. Reluctant altruism is seen as important for first time donation because the reluctant altruist is attracted by the levels of high free-riding in blood donation (approx. 96%). Thus, if the reluctant altruist is seeking a worthy cause, they can make a difference in, that has a high free-riding rate, they will be attracted to become a blood donor.

Implications for Interventions

The MOA has a number of clear and novel implications for interventions. When considering interventions, the Nuffield Council extends the notion of altruism as a construct "…underpinning important communal values expresses something very significant about the kind of society in which we wish to live. Understood in this way, altruism has much in common with solidarity: an altruistic basis for donation helps underpin a communal, and collective, approach to the provision of bodily material for others' needs, where generosity and compassion are valued. (p. 5 [1])." This implies that the interventions we choose have implications for the sort of society we wish to live in. We will consider this further in the discussion of different interventions below.

Below we briefly detail a series of interventions derived from the MOA approach: (1) charitable incentives and financial incentives, (2) guilt priming, (3) norms focused on donors rates, (4) voluntary reciprocal altruism (VRA) (5) warm-glow appeals and (6) empathizing with a single case.

Implications for Wider Theoretical Models

The MOA has implications for existing theoretical models applied to blood donation. Two questions are pertinent: (1) How do the constructs in these models theoretically relate to MOA? and (2) Does the MOA add extra predictive value?

The Theory of Planned Behaviour (TPB) is the most frequently applied to blood donation [39-40]. The TPB suggests that a behaviour is predicted proximally by intentions, with intentions predicted by (1) attitudes, (2) subjective norms (i.e., people who are important to the donor approve of blood donation) and (3) perceived behavioural control (PBC: i.e., feeling able to donate despite possible barriers). PBC also has a direct effect on behaviour. Attitudes can be further split in to affective (i.e., anticipated positive or negative emotional responses) and cognitive (i.e., the pros and cons) [41]. TPB is also extended in this domain to include (1) descriptive norms (the perception of how many others perform the behaviour) and (2) personal moral norms (the person's individual moral obligations) [39].

In the prosocial domain, four of these constructs – affective attitudes, subjective norms, descriptive norms and personal moral norms –overlap with four MOA (Table 2). Affective attitudes and subjective norms are closely linked to warm-glow and reputation building. That is, affective attitudes reflect anticipated feelings associated with the act of giving and thus reflect warm-glow. Donating because others think it is a valued activity (subjective norm) may ultimately be concerned with reputation regulation – what others think of you matters. Descriptive norms reflect beliefs about how many others are believed to perform the behaviour. It is possible that such beliefs may drive conditional cooperation , but requires empirically testing. Beliefs concerning personal moral

norms have been operationalized to include avoiding anticipated guilt and as such may be drive in some small part by inequality aversion.

Indices of 'altruism' have also been added to TPB. For example, Lemmens et al. [42] showed that an index of general altruism did not add incrementally to the prediction of donor behaviour. This is mostly likely because the altruism index was domain non-specific whereas the TPB items were blood donation specific.

The function (motivational) model of volunteer behaviour [43] is gaining some currency as a model in the blood donation literature [44]. Six motivations for volunteering have been identified [45-46]. The six motives are described in Table 2. Again all six resonate with the MOA (Table 1). While these motivations are derived from very different traditions in social psychology, the clear correspondence with MOA adds extra validity to these motivations, showing clear links to wider economic and psychological theory. It also suggests specific hypotheses. For example, the 'Enhancement' motivation should be the strongest predictor within the context of blood donation.

A Model of Donor Motivation Derived from the MOA Approach

Based on the MOA work conducted so far, an overall model of how these motivates inter-play in terms of donor recruitment and retention is sketched put here. Reluctant altruists are looking for a worthy cause where free-riding is high. Warm-glow givers are looking for a context that affords maximum warm-glow. Reluctant altruism and warm-glow are correlated, but there will also be those who are just reluctant altruist and those who are just motivated by warm-glow [23]. There will also be those who only discover *after* donation that they gain a lot of warm-glow from donating. Both those initially attracted by warm-glow and those who discover warm glow as an outcome of donation

will be reinforced by warm-glow and self-select as donors. The reluctant altruist will remain as a donor, as free-riding remains high.

Conclusions

The application of the MOA approach indicates that donors are not pure altruists, but motivated by warm-glow and reluctant altruism. Other avenues for future research involve examining if blood donor populations consist of high proportions of condition cooperators and if blood donors have a strong inequality aversion. The MOA findings indicate that incentives (charitable or financial), warm-glow appeals and VRA should be used and may be very effective.

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Table 1. Mechanisms for Altruism and Blood Donation

Discipline	Mechanism	Description	Blood Donation
Biology	Direct Reciprocity	If you expect to see the same person again, then helping them directly increases the probability that they will repay the favour at some future date and help you	This mechanism cannot underlie blood donation as donor and recipient never meet or interact.
	Down Stream Indirect Reciprocity	You gain a positive reputation from helping (either via direct observation or gossip). That positive reputation increases the likelihood of being helped by another unrelated person in the future, as long as they know your reputation.	Unlikely mechanism for blood donation as donors rarely publicize they are donors [ref]or may only work for donors motivated by social approval [ref] . May work by repaying the good reputation of the transfusion service, if they feel the transfusion has helped someone you know
	Up Stream Indirect Reciprocity	If you are helped by someone you feel grateful and go on to help another unrelated person.	Unlikely mechanism for blood donation as the recipient of a transfusion is unlikely to be able to donate to help another person
	Strong Reciprocity	Strong reciprocators will preferentially offer help to those with a good reputation and punish those with a poor reputation, even when they do not expect future reciprocation.	Blood donors are no more likely to help and punish than non-donors.
	Costly Signals	Costly signals are costs (e.g., pain) or attributes (e.g., altruism) that are not fakable by the organism, as the organism sustains the cost of the signal without detriment (Zahavi, 1977).	Blood donation can be characterized as a *costly signal* (Lyle, Smith & Sullivan, 2009), but to be so, it has to be displayed.
	Kin	Preferential helping is directed towards relatives than non-relatives	Unlikely to underlie blood donation in developed countries as donors cannot give blood preferentially to their relatives, but is still a mechanism adopted in developing countries (Aseno-Mensah et al).

Economics	Warm-Glow	This is the extra emotional utility the person feels from the act of helping. This may be both anticipated and experienced.	Potential Mechanism as successful donation is likely to afford a high level of positive emotions. Also warm-glow is unconditional with respect to recipient characteristics (it does not matter who gets the blood).
	Inequality Aversion	People have a preference to reduce inequality between themselves and another, based on norms of fairness. If the other person has more (disadvantageous inequality) the reduction is driven by *envy* and if the other has less (advantageous inequality) it is driven by guilt. It is argued that envy is a stronger driver then guilt.	Suggests that guilt may be a potential mechanism to motivate donors. That is, having blood and knowing that others need it may result in advantageous inequality leading to the need to reduce guilt.
	Conditional Cooperation	Conditional cooperation occurs when a person is aware of others levels of helping and matches these, but gives just slightly less.	Suggests that conditional cooperators (CCs) are sensitive to information concerning the percentage of donor and will respond proportionally. Thus saying that only 4% of the eligible population donate may result in a small percentage (< 4%) of CCs donating
Psychology	Empathy-Altruism	Empathy aroused towards a target in distress results in feelings of sympathy and compassion toward the target, motiving the ultimate desire to relieve the persons distress	A potential mechanism as long as the donor is able to visualise who is being helped. Evidence however, suggests that trait empathy may have little role to play in blood donation.
	Negative State Relief	Observing a target in distress results in personal feelings of distress, and the helper is motivated to help to reduce these personal negative feelings.	A potential mechanism, as guilt that may arise from advantageous inequality aversion may motive donation. Indeed, guilt as a motivation for donation is reported.

	Reluctant Altruism	Reluctant altruist offers help preferentially in the context where others free-ride compared to a context where help is frequently offered. This is especially the case if the target of help is a 'good cause' or has a good reputation. Reluctant altruists are more likely to evangelise about blood donation.	A potential mechanism as free-riding is high in blood donation. This will especially be the case for first time donors.
	Personality	Relatively stable enduring predispositions to respond in a particular way given a particular context.	Conscientiousness has been identified a key predictor of repeat donations.

Table 2: MOA and Constructs from the Theory of Planned Behaviour and Functional Model of Volunteering

Theory	Construct Definition	Example Item	Biology, Economics or Psychology
Theory of Planned Behaviour			
Affective attitude	Anticipated positive or negative emotional responses towards blood donation	If I were to give blood during the next six months … I would be happy [47]	Warm-Glow
Cognitive Attitude	Pros and cons of blood donation	For me giving blood in the next six months would be … very bad/good	
Subjective Norm	People who are important to the donor approve of blood donation	If I were to give blood, most of the people who are important to me would… strongly disapprove/approve [48]	Reputation Building
Behavioural Control	Feeling able to adopt the behaviour despite possible barriers (physical or psychological)	"I feel capable of giving blood"	
Descriptive Norn	The extent to which other perform the behaviour	"A lot of people I know give blood" [48]	Conditional Cooperation
Personal Moral Norm	Personal moral obligation towards the behaviour	"If I did not donate blood, I would feel guilty" [22]	Inequality Aversion
Volunteer Functions			
Values	Volunteers can express values of altruism/humanitarianism	I feel compassion toward people in need	Pure Altruism
Understanding	Volunteer can learn new skills that they would not normally have the chance to exercise	I can explore my own strengths	Self-Interest
Social	Volunteer in activities that important others view favourably and strengthen social bonds	Volunteering is an important activity to people I know best	Reputation Building
Career	Volunteering enhances career related goals	Volunteering experience will look good on my resume	Self-Interest
Protective	Volunteering is ego protecting by reducing feelings of guilt from being better off	By volunteering I feel less lonely	NRS/Inequality Aversion
Enhancement	Volunteers grow personally and emotionally	Volunteering makes me feel better about myself	Warm-Glow